The Royal Society of Western Australia Medallist, 2001

Dr Phillip Playford

Geological Survey of Western Australia

Born in Guildford, Western Australia in 1931, Phillip Playford graduated in 1952 from the University of Western Australia with First Class Honours in Geology. He found employment as a field geologist with the Bureau of Mineral Resources but soon transferred to a similar position with West Australian Petroleum who were searching for oil near Exmouth Gulf. Over the next eight years he rose to become Staff Stratigrapher. His work concentrated initially on unravelling the stratigraphy of the southern Camarvon Basin and the lower Murchison area. Later he moved to the Perth Basin, his research leading to the discovery of the Dongara gas field. While with WAPET, Phillip also began research on the Devonian Reefs of the Canning Basin; this became a life-long interest.

In 1960 Phillip went to the USA and Stanford University, gaining a PhD in geology in 1962. In that year he returned to the Public Service, as Supervising Geologist of the Sedimentary (Oil) Division with the Geological Survey. He supported the drilling program that led to the discovery of the Barrow Island oil field. After a short time as Exploration and then General Manager with Abrolhos Oil, in 1970/71 he continued his career with the Geological Survey, becoming Deputy Director in 1980. From this position he was promoted to Assistant Director General of Mines and finally transferred sideways to become Director of the Geological Survey. Since retiring in 1992, he has spent several months each year with Survey staff in the Canning Basin and at Shark Bay, continuing to make new discoveries. In all he has published 95 scientific papers.

While all this was happening, Phillip had another life, in history. Since seeing the remains of an old sailing ship at the foot of the rugged cliffs north of the Murchison River he has studied wrecks on the Western Australian coast and the history of voyages by the Dutch East India Company. His book on the Zuytdorp (Carpet of Silver) won its category in the WA Premier's Book Awards for 1996. It was followed by an account of Willem de Vlamingh's voyage to the Swan River in 1697.

Phillip joined the Royal Society in 1952 and served on Council for 25 years. He was President in 1969/70 and was awarded Honorary life Membership in 1999.

Other honours that he has received include; Gibb Maitland Medal of the Geological Society of Australia, Lewis G Weeks Gold medal of the Australian Petroleum Exploration Association, Special Commendation Award of the American Association of Petroleum Geologists, Distinguished Membership Award of the Petroleum Exploration Association of Australia, Honorary Life Member of the National Trust (WA), Honorary Doctor of Science of The University of Western Australia, and Member of the Order of Australia (AM).

The Permo-Carboniferous Glaciation of Gondwana: its legacy in Western Australia (Medal Address March 2001)

It has long been known that large areas of the Gondwana Supercontinent, comprising Australia, Antarctica, Africa, India, and South America, were subject to repeated glaciations during the Early Permian and Late Carboniferous (about 270 to 320 million years ago), but there has been no general agreement on the form and magnitude of those glaciations. In Western Australia, the best evidence of glaciation is displayed in Early Permian strata and landforms, but some authorities have claimed that this does not point to the existence of major ice sheets in the area at that time.

That view is now challenged by new evidence, mainly derived from glacial landforms, which indicate that a succession of major wet-based ice sheets, several kilometres thick, probably extended across all or most of the Australian continent and other parts of Gondwana during the Early Permian. The ice, moving away from the south pole, generally travelled north-northwest over Western Australia and South Australia and north-northeast over Victoria and Tasmania, as shown by striations in glaciated pavements formed below the ice.

In the northern Canning Basin, the uppermost surface of the Devonian limestone ranges is sub-horizontal, essentially marking the level of the Early Permian unconformity. The unconformity surface, where freshly exposed, is a striated glacial pavement, indicating movement of the ice to the north and north-northwest, directly towards the mountainous area of the Kimberley Block, which at that time was probably entirely covered by ice. Extensive karst features and glacial valleys were formed in limestones in the

subglacial environment, and are now exposed where the overlying Grant Group has been removed by Cainozoic erosion. The exhumed Early Permian geomorphic features consist of extensive cave systems, canyons, dry valleys, tunnels, and dolines, notable examples including Mimbi Caves, Windjana Gorge, Menyous Gap, and Tunnel Creek.

Early Permian glacial landforms are widely developed in Precambrian rocks along the northern margin of the Pilbara Block. They comprise ice-scoured channels, U-shaped valleys, rock drumlins, and polished striated pavements, conspicuous examples including the valley of Shay Gap, a drumlin field near Carawine Pool, and a major linear channel north of Pearana Rockhole. These features of the modem landscape were originally formed below the base of a thick continental ice sheet during the final culmination of the ice age.

The Permo-Carboniferous ice age was one of the most momentous events in the geological evolution of Western Australia, with far-reaching geomorphological effects that are still evident in modem landscapes. Relict glacial landforms are widespread, and show that extensive areas of the Great Plateau, covering the Yilgarn Block and parts of the Pilbara and Kimberley Blocks, were planed down below the ice, forming a level surface above which a few remaining hills and mountains projected. The glaciated surface was dissected by a network of rivers during pluvial periods of the Mesozoic and Early Tertiary. Remnants of those river systems are preserved today as shallow palaeochannels crossing the otherwise level surface of the Great Plateau, a surface that basically is inherited from the Permo- Carboniferous glaciation of this part of Gondwana.